

**To:** Way, Steven[way.steven@epa.gov]; Petri, Elliott[Elliott.Petri@WestonSolutions.com]  
**Cc:** Griswold, Hays[Griswold.Hays@epa.gov]; Guy, Kerry[Guy.Kerry@epa.gov]  
**From:** Goertz, Dave  
**Sent:** Mon 9/28/2015 3:01:43 PM  
**Subject:** RE: Pipe inlet - sump at GK  
Entrance velocity 12 in pipe.pdf  
12-inch pipe.pdf

Steve,

I have attached two calculations. The hand calculation shows the velocity water would have to enter the 12-inch pipe running full for both 1000 gpm and 600 gpm flows. The calculations show the velocities would have to be 3.9 and 2.3 feet per second respectively. These are reasonable entrance velocities. Make the pipe any smaller and the required entrance velocities would go up significantly. The second calculations show the flow rates of the twelve inch pipe at different depths and a percent of the 12 inch ID when the pipe is at equilibrium (using Manning's equation). This is also the calculation APTec's has provided. As you can see, at 600 gpm the pipe is only running about 30% full, but the velocity in the pipe is 8 feet per second. I don't think that velocity will be reached until the water has moved down the pipe and accelerated due to gravity. Call if you have questions.

Thanks,

Dave

**David Goertz, PE**

Weston Solutions, Inc.

1435 Garrison Street, Suite 100

Lakewood, CO 80215

Office: 303 729-6123

Cell: 720 635-0818

dave.goertz@westonsolutions.com

**From:** Way, Steven [mailto:[way.steven@epa.gov](mailto:way.steven@epa.gov)]  
**Sent:** Sunday, September 27, 2015 8:18 AM  
**To:** Petri, Elliott  
**Cc:** Griswold, Hays; Guy, Kerry; Goertz, Dave  
**Subject:** Pipe inlet - sump at GK

Elliott and Dave,

Please provide the calculations / design assumptions for pipe sizing from the mine to sump and sump to pipe to Gladstone.

Thank you

Steve

Sent from my iPhone

On Sep 26, 2015, at 2:46 PM, Petri, Elliott <[Elliott.Petri@WestonSolutions.com](mailto:Elliott.Petri@WestonSolutions.com)> wrote:

Please note the original email had the wrong Dave Goertz as the email address. His email is [Dave.Goertz@WestonSolutions.com](mailto:Dave.Goertz@WestonSolutions.com)

Elliott Petri, PE

Weston Solutions, Inc.

1435 Garrison St, Ste 100

Lakewood, CO 80215

Ph: 303-729-6156

Cell: 719-216-2754

Fax: 303-729-6101

**From:** Petri, Elliott  
**Sent:** Saturday, September 26, 2015 11:45 AM  
**To:** Steven Way <[Way.Steven@epa.gov](mailto:Way.Steven@epa.gov)>; Hays Griswold <[Griswold.Hays@epa.gov](mailto:Griswold.Hays@epa.gov)>;  
Kerry Guy <[Guy.Kerry@epa.gov](mailto:Guy.Kerry@epa.gov)>; Jones, Tana <[Tana.Jones@WestonSolutions.com](mailto:Tana.Jones@WestonSolutions.com)>  
**Subject:** Berms for Gladstone ponds

Forwarded from Dave Goertz

**Elliott Petri, PE**

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*Fax: 303-729-6101*

*Sent from a tiny phone screen, most likely with sun glare. Please excuse typos!*

----- Original Message -----

Subject:

From: "Goertz, Dave" <[Dave.Goertz@WestonSolutions.com](mailto:Dave.Goertz@WestonSolutions.com)>

To: "Petri, Elliott" <[Elliott.Petri@WestonSolutions.com](mailto:Elliott.Petri@WestonSolutions.com)>

CC:

We need the following Gladstone ponds berm information to package and give to the geotechnical engineer on Monday morning. You can email it to me and I will see he gets it. We need:

- The gradation report

- A description of the construction of the berm including:
  - Height of lifts
  - Compaction methods used on each lift
  - Qualitative idea of the moisture content of the soil during construction (slightly moist, bone dry etc.)
- Profile or profiles of the berm including dimensions and high water level

I know some of this information will be difficult to accurately provide but do the best you can. The opinion we get will be as good as the information we give him. If some of these data are ranges that is ok.

**David Goertz, PE**

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